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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,951	04/13/2004	Lewis Athanas	MAN03	3597
32047	7590	07/06/2005	EXAMINER	
GROSSMAN, TUCKER, PERREAULT & PFLEGER, PLLC 55 SOUTH COMMERICAL STREET MANCHESTER, NH 03101			DOUGHERTY, THOMAS M	
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 07/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/822,951

**Applicant(s)**

ATHANAS, LEWIS

**Examiner**

Thomas M. Dougherty

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 404, 305, 505
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Terminal Disclaimer***

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-21 are rejected under the judicially created doctrine of double patenting over claims 1-14 of U. S. Patent No. 6,720,708 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: curved diaphragm, actuator, support, circuitry, transparency, piezoelectric bimorph or unimorph, video screen, sectioning.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,3-7, 9, 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Takeuchi et al. (US 5,767,612). Takeuchi shows (figs. 4 and 15) an acoustic transducer that can convert mechanical motion into acoustical energy, said transducer comprising: a diaphragm (10 in fig. 4) that is curved, at least one support (see 30 for example in figure 15) on at least one portion of said diaphragm (10); and at least one actuator (18 in fig. 4, 24 in fig. 15) operatively coupled to said diaphragm (10) and spaced from said support (30), said actuator (24) configured to move such that movement of said actuator (24) produces corresponding movement of said diaphragm (10), said diaphragm (10) movement being amplified with respect to said actuator movement (24). Note that this last description of motion is regarded as a goal of the invention, as Takeuchi et al. show the claimed structure, they are regarded as reading on this goal, unless the applicant's goal cannot be met by the structure claimed.

Said actuator (24) is operatively coupled to said diaphragm (10) to partition said diaphragm (10) into two sections, each containing an edge, and wherein said support (30) includes supports fixed at said edge of said diaphragms (10) distal from said actuator (24).

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Curved diaphragm (10) comprises one section that is convex (above 38) and another section that is concave (at supports).

Said diaphragm (10) is partitioned into two diaphragms (see fig. 15), and said actuator includes a pair of piezoelectric actuators (24) that are each operatively coupled to said edge of diaphragms (for example as shown in fig. 4) to form two diaphragm sections.

Said at least one actuator is characterized by a high force and short linear travel. Note that this is regarded as a goal of the invention, as Takeuchi et al. show the claimed structural features, this goal is likewise met by them.

Said curvature is generally parabolic.

The at least one actuator is a piezoelectric actuator. See the title of the invention.

The piezoelectric drive is a single layer piezo actuator.

Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Kumada et al. (US 4,352,961). Kumada et al. show (fig. 6) a speaker (see title) for use over a display screen (10), said speaker comprising: an optically clear diaphragm (5); at least one support (4) on at least one portion of said optically clear diaphragm (5); and at least one actuator (13) operatively coupled to said optically clear diaphragm (5) and spaced from said support (4) such that movement of said actuator (13) produces movement of said diaphragm (5), said diaphragm (5) movement being amplified with respect to said actuator (13) travel. Note that this last is regarded as a goal of the applicants' invention. As Kumada et al. show the claimed features, this is regarded as being met by them.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (US 5,767,612) in view of Kishimoto (US 6,472,797). Given the invention of Takeuchi et al. as noted above, they don't discuss show a piezoelectric bimorph drive.

Kishimoto shows a piezoelectric bimorph drive (fig. 12-14) for use in an electro-acoustic transducer.

Kishimoto doesn't show a curved diaphragm.

It would have been obvious to one having ordinary skill in the art to employ the piezoelectric bimorph of Kishimoto in the device of Takeuchi et al. at the time of their invention because it results in larger displacement. See col. 3, ll. 48-49.

Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (US 5,767,612) in view of Athanas (US 5,283,835). Given the invention of Takeuchi et al. as noted above, they don't discuss their driving circuitry.

Athanas shows (fig. 5) a driving circuit for an acoustic transducer which is operatively connected to the actuator.

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Said drive circuit comprises an active filter (R1, L1) and an amplifier (36).

Said drive circuit further comprises a step-up transformer (T) (albeit a negative step) and a resistor (R2) connected in series with said transformer (T) to control high frequency response.

Athanas notes that he drives the device below resonance, and not at resonance, however this is a method of operating the device which is not further limiting to the structure. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987).

Athanas doesn't show a specific curved diaphragm with an attached piezoelectric element, but instead shows a curved piezoelectric component.

It would have been obvious to one having ordinary skill in the art to employ the drive circuit of Athanas in the device of Takeuchi et al. in order to allow the Takeuchi et al. device to do useful work.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kumada et al. (US 4,352,961). Given the invention of Kumada et al. they don't show a plurality of diaphragms each fixed along a line, and including a plurality of actuators that are each operatively coupled to one edge of the diaphragm to form a plurality of diaphragm sections.

It would have been obvious to one having ordinary skill in the art to employ a plurality of diaphragms and a plurality of actuators, arranged as noted above, since it

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has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St. Regis Paper Co. v. Bemis Co. 193 USPQ 8.

***Allowable Subject Matter***

Claims 2, 8 and 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims if a terminal disclaimer is filed.

The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to show or fairly suggest a curved diaphragm which is optically clear on a support and which has an attached acoustic transducer. Likewise not shown nor fairly suggest iis such a diaphragm overlying a video screen display.

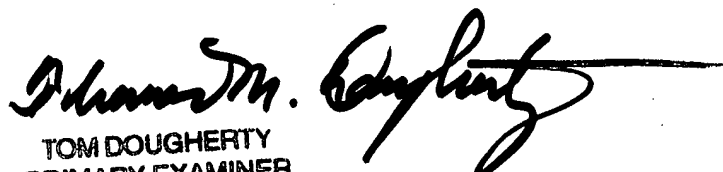
***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The remaining prior art cited reads on some aspects of the claimed invention.

Direct inquiry to Examiner Dougherty at (571) 272-2022.

tmd  
tmd

July 5, 2005

  
TOM DOUGHERTY  
PRIMARY EXAMINER